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EXAMINER	
BRADLEY, MATTHEW A	
ART UNIT	PAPER NUMBER
2187	
NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	**Application No.** 10/681,618	**Applicant(s)** WILLIAMS ET AL.
	Examiner MATTHEW BRADLEY	**Art Unit** 2187

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _05 May 2009_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-12,14-19,21 and 23-38_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-12, 14-19, 21, and 23-38_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action has been issued in response to amendment filed 5 May 2009. Applicant's arguments filed 22 January 2009 have been carefully and fully considered and are partially persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made as noted *infra*. Accordingly, this action has **NOT** been made final.

Claim Status

Claims 1-12, 14-19, 21, and 23-38 remain pending and are ready for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **14**-**19** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claim **14** recites the limitation "of the access requests" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim as there are access requests to a first predefined region and access requests to a second predefined region. For purposes of examination the Examiner is interpreting the recitation to be drawn to access requests to a second predefined region. Appropriate correction is required.

Any claim not specifically addressed is rejected to at least by virtue of its dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1**-**5**, **8**-**12**, **25**-**27**, **29**-**34**, and **38** are rejected under 35 U.S.C. 102(b) as being anticipated by Christenson et al (U.S. 6,324,620), hereinafter referred to as Christenson.

As per independent claim **1**, Christenson teach, an access controller configured to control access requests to a storage device by metering access to data within a first predefined region (Column 6 lines 45-67: taught as the COLD REGION) within the storage device and by allowing unmetered access to data within a second predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION). (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The Examiner notes that in referring back to Applicant's specification, paragraph 0025, 'cold access requests can be metered by, for example, ... giving priority to hot access requests…' The Examiner notes that Christenson teaches that, "requests for HOT data from high priority jobs are handled first. Next, requests for COLD for a high priority job is handled (Column 12 lines 23-25." As simply and broadly claimed, by handling the requests for* *the HOT data before the handling of requests for COLD data, Christenson teaches that which is instantly claimed.*

As per dependent claim **2**, Christenson teach, where the system is embedded in one of, a database system, an operating system, and an application configured to process access requests to the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **3**, Christenson teach, where the system further includes allocation logic configured to determine a priority for data to be written to the storage device and causing the data to be stored within the first region or the second region based on the priority (Column 8 line 62 to Column 9 line 5).

As per dependent claim **4**, Christenson teach, where the priority of the data includes a plurality of priority levels (Column 13 lines 13-14: taught as COLD data, HOT data, or neither).

As per dependent claim **5**, Christenson teach, where the storage device includes one or more disk drives (Column 3 lines 56-61: taught as a plurality of DASD units).

As per dependent claim **8**, Christenson teach, where the system is embedded in a file system configured to process data input and output requests to the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **9**, Christenson teach, where the access requests include at least one of data input and data output requests (Column 3 lines 36-38: taught as data access, i.e. output).

As per dependent claim **10**, Christenson teach, where the access controller is configured to meter access based on a threshold of access requests directed to the data within the first region (Column 3 lines 42-45 of Christenson: taught as restricting I/O requests to the "COLD" based on the low frequency threshold of accesses for the data in the portion. This is further taught in Column 10 lines 14-53 of Christenson. If the threshold of access for the data is exceeded, the system of Christenson moves the data to unmetered access, “HOT” as taught in Column 10 lines 56-67).

As per dependent claim **11**, Christenson teach, further including one or more tables configured to define at least the data in the first region to be metered (Column 17 lines 31-59: taught as the ASP table and utilization thereof).

As per dependent claim **12**, Christenson teach, where the data in the one or more tables is configured to define one or more of, a file, an application, and a data location (Column 17 lines 7-43: taught as the interfacing with the ASP table).

As per independent claim **25**, Christenson teach, processing access requests to a storage device; and controlling the access requests to the storage device by metering access to data within a first predefined region within the storage device (Column 6 lines 45-67: taught as the COLD REGION) and by allowing unmetered access to data within a second predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION). (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The Examiner incorporates by reference herein and further notes that Christenson teach a computer readable medium as claimed at least as is shown in Claims 41 and 43.*

As per dependent claim **26**, Christenson teach, where the storage device includes a disk drive (Column 3 lines 56-61: taught as a plurality of DASD units).

As per dependent claim **27**, Christenson teach, further including processor executable instructions operable to cause a processor to store data to the storage device based on a priority of the data, the data being stored in one of the first region and the second region (Column 7 lines 13-43).

As per dependent claim **29**, Christenson teach, where the metering includes limiting a number of the access requests to the first region from being processed (Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are limited).

As per dependent claim **30**, Christenson teach, where the processing includes determining to which region each of the access requests is directed (Column 12 lines 18-32).

As per dependent claim **31**, Christenson teach, further including processor executable instructions operable to cause a processor to define at least the first region and the second region within the storage device (Column 9 lines 24-54: taught as the partitioning of the DASD unit)

As per dependent claim **32**, Christenson teach, including means for allocating data to a selected region within the storage device (Column 11 lines 1-16).

As per dependent claim **33**, Christenson teach, where the computer-readable medium is integrated with at least one of: a data base system, a file system, an operating system, and the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **34**, Christenson teach, access controller means for metering access requests to the first region (Column 5 line 65 to Column 6 line 41:the means being taught as the system; and Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are metered).

As per independent claim **38**, Christenson teach, receiving access requests to a storage device; and increasing response time for access requests to a first predefined region within the storage device by metering access requests to a second predefined region within the storage device (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The Examiner notes that in referring back to Applicant's specification, paragraph 0025, 'cold access requests can be metered by, for example, ... giving priority to hot access requests…' The Examiner notes that Christenson teaches that, "requests for HOT data from high priority jobs are handled first. Next, requests for COLD for a high priority job is handled (Column 12 lines 23-25)." As simply and broadly claimed, by handling the requests for the HOT data before the handling of requests for COLD data, Christenson teaches that which is instantly claimed.*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **6**-**7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson and in view of Cousins (U.S. 6,671,772), hereinafter referred to as Cousins.

As per dependent claim **6**, Christenson teach the limitations as noted supra.

Christenson does not explicitly teach, where the storage device includes a disk and where the second region is defined closer to a perimeter of the disk than the first region.

Cousins teaches, where the storage device includes a disk and where the second region is defined closer to a perimeter of the disk than the first region (Column 3 lines 24-27: taught as the placement of sectors on the outside of the disk).

Christenson and Cousins are analogous art because they are from the same field of endeavor namely, disk storage devices.

At the time of invention, it would have been obvious to one of even rudimentary ordinary skill in the art, having both the teachings of Christenson and Cousins before him/her to combine the placement of sectors on the outside tracks of the disks of Cousins with Christenson for the benefit of reduced seek times.

The suggestion for doing so would have been that, to help address minimizing seek times of the disk, over the past few years, disk densities have been improved by placing more sectors on tracks at the outside of a disk than at the inside of the disk (Column 3 lines 24-27).

The Examiner further notes that all of the component parts are known in Christenson and Cousins. The only difference is the combination of the old elements by implementing the placement of sectors on tracks at the outside of a disk to reduce seek times of Cousins into the device of Christenson. As the combination of Christenson and Cousins teaches each limitation as instantly claimed, and as such is known in the prior art, one skilled in the art could have combined the elements from Christenson and

Cousins by known methods with no change in their respective functions, and the combinations thereof would have yielded predictable results to one of ordinary skill in that art thus obviating that which is instantly claimed.

Therefore, it would have been obvious to combine Christenson with Cousins for the benefit of reduced seek times to obtain the invention as specified in claims 6-7.

As per dependent claim **7**, the combination of Christenson and Cousins teach, where the first region and the second are defined by one or more logical block addresses (Column 13 lines 33-59 of Christenson: taught as the logical dasd and the 1:1 correlation between the logical dasd and the subsystem).

Claims **14**-**19**, **28**, and **35**-**37**are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson and in view of Johnson (U.S. 2002/0138670), hereinafter referred to as Johnson.

As per independent claim **14**, Christenson teach, receiving access requests to a storage device; and increasing response time for access requests to a first predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION) by metering access requests to a second predefined region within the storage device; (Column 6 line 45-67: taught as the COLD REGION)

Christenson does not explicitly teach, where the metering includes limiting a number of access requests to the second region based on a threshold number of the access requests.

Johnson teach, where the metering includes limiting a number of access requests to the second region based on a threshold number of the access requests (Paragraphs 0020 and 0025).

Christenson and Johnson are analogous art because they are from the same field of endeavor, namely disk storage systems.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having both the teachings of Christenson and Johnson before him/her, to combine the starvation counter of Johnson with Christenson to prevent starvation of the low priority requests.

The motivation for doing so would have been that, if the starvation counter reaches a predetermined maximum value, then requests are processed from the low priority I/O queue to prevent starvation of the low priority I/O requests in the event there is a stream of numerous high priority I/O requests (Paragraph 0020 of Johnson).

Therefore, it would have been obvious to combine Johnson with Christenson for the benefit of the prevention of starvation to obtain the invention as specified in claims 14-19, 28, and 35-37.

As per dependent claim **15**, the combination of Christenson and Johnson teach, storing data to be metered within the storage device based on a priority level of the data (Column 7 lines 13-43 of Christenson).

As per dependent claim **16**, the combination of Christenson and Johnson teach, determining, for a selected data, whether the selected data will be stored within the first region or the second region (Column 9 line 57 to Column 10 line 13 of Christenson).

As per dependent claim **17**, the combination of Christenson and Johnson teach, defining a plurality of regions within the storage device; and assigning a metering threshold for selected regions of the plurality of regions (Column 10 lines 14-53 of Christenson).

As per dependent claim **18**, the combination of Christenson and Johnson teach, where the plurality of regions are defined by setting one or more addresses within the storage device (Column 9 lines 27-55 of Christenson: taught as the partitioning and the addresses resulting therefrom).

As per dependent claim **19**, the combination of Christenson and Johnson teach, monitoring a number of access requests to the second region; and initiating the metering when the number of access requests reaches a threshold (Paragraph 0020 and 0025 of Johnson).

As per independent claim **28**, the combination of Christenson and Johnson teach, processing access requests to a storage device; metering access requests to a first predefined region within the storage device to maintain response time for access requests to a second predefined region within the storage device; and setting a threshold value of access requests, where access requests to the first region are caused to be metered after the threshold value of access requests are processed (*The Examiner incorporates by reference herein the rejection made supra with respect to claim 14 and further notes that Christenson teach a computer readable medium as claimed at least as is shown in Claims 41 and 43*).

As per independent claim **35**, the combination of Christenson and Johnson teach, allocation logic configured to define a plurality of regions within the storage device based on information received from a user; (Column 12 lines 35-61 of Christenson) threshold logic configured to assign a metering threshold to one or more selected regions of the plurality of regions; and an access controller configured to process access requests to the storage device, the access controller including logic configured to meter access requests to a selected region of the plurality of regions once a metering threshold for the selected region is met (Paragraph 0020 and 0025 of Johnson).

As per dependent claim **36**, the combination of Christenson and Johnson teach, where the allocation logic is further configured to cause selected data to be placed within a selected region of the plurality of regions based on a frequency of access to the selected data (Column 6 lines 46-67 of Christenson).

As per dependent claim **37**, the combination of Christenson and Johnson teach, where the access controller includes means for metering access requests (Column 5 line 65 to Column 6 line 41 of Christenson: the means being taught as the system; and Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are metered).

Claims **21** and **23**-**24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson in view of Johnson and further in view of Cousins.

As per independent claim **23**, Christenson teach, receiving I/O requests directed to a storage device; determining a priority level of each of the I/O requests; allowing I/O requests having a first priority level to be processed; limiting I/O requests having a second priority level, (Column 12 lines 18-32)

Christenson does not explicitly teach, where the priority level of an I/O request is determined based on a predefined location of data within the storage device associated with the I/O request; and where data located adjacent a perimeter of the storage device receives the first priority level and where data located adjacent a hub of the storage device receives the second priority level.

Johnson teach, where the priority level of an I/O request is determined based on a predefined location of data within the storage device associated with the I/O request; and (Paragraph 0019).

Johnson does not explicitly teach, where data located adjacent a perimeter of the storage device receives the first priority level and where data located adjacent a hub of the storage device receives the second priority level.

Cousins teach, where data located adjacent a perimeter of the storage device receives the first priority level and where data located adjacent a hub of the storage device receives the second priority level (Column 3 lines 24-27 of Cousins).

Christenson, Johnson, and Cousins are analogous art because they are from the same field of endeavor namely, disk storage devices.

At the time of invention, it would have been obvious to one of even rudimentary ordinary skill in the art, having both the teachings of Christenson and Cousins before him/her to combine the placement of sectors on the outside tracks of the disks of Cousins with Christenson for the benefit of reduced seek times.

The suggestion for doing so would have been that, to help address minimizing seek times of the disk, over the past few years, disk densities have been improved by placing more sectors on tracks at the outside of a disk than at the inside of the disk (Column 3 lines 24-27).

The Examiner further notes that at the time of invention it would have been obvious to a person of ordinary skill in the art, having both the teachings of Christenson and Cousins and Johnson before him/her, to combine the starvation counter of Johnson with Christenson and Cousins to prevent starvation of the low priority requests.

The motivation for doing so would have been that, if the starvation counter reaches a predetermined maximum value, then requests are processed from the low priority I/O queue to prevent starvation of the low priority I/O requests in the event there is a stream of numerous high priority I/O requests (Paragraph 0020 of Johnson).

Therefore, it would have been obvious to combine Johnson with Christenson and Cousins for the additional benefit of the prevention of starvation and the benefit of the placement of sectors on the outside tracks of the disks to obtain the invention as specified in claims 21 and 23-24.

As per dependent claim **24**, the combination of Christenson, Johnson, and Cousins teach, where the location of the data is determined based on one or more predetermined addresses within the storage device (Paragraph 0019 of Johnson).

As per dependent claim **21**, the combination of Christenson, Johnson, and Cousins teach, where the limiting includes restricting the I/O requests having the second priority level based on a threshold number of I/O requests having the second priority level (Paragraphs 0020 and 0025 of Johnson).

Response to Arguments

Applicant's arguments, filed 22 January 2009, have been fully considered and are partially persuasive. However, upon further consideration, a new ground(s) of rejection is made as noted *supra*.

With respect to Applicant's argument located within the first full paragraph of the fourth page of the instant remarks (numbered as page 13) which recites in part:

> *"Thus if giving priority is regarded as metering, the cited section fails to teach or suggest "allowing unmetered access to data within a second predefined region" as recited in the claim. Either way Christenson is interpreted, neither the HOT region nor the COLD region receives "unmetered access to data" as recited in claim 1. Thus the claimed access controller is not taught."*

The Examiner respectfully disagrees. Independent claim 1, simply and broadly claims that access to data in a first region is metered by allowing unmetered access to data in a second region. While Applicant's comments are well taken and appreciated, the Examiner notes that Christenson teach that which is instantly claimed. Access to HOT data of Christenson is, in view of high priority jobs, is given over the accesses to COLD data. Thus, a high priority job of Christenson is given unmetered access to HOT data and the high priority job requests to access COLD data of Christenson are metered. Accordingly, Christenson teach that which is instantly claimed.

Any argument not specifically addressed is considered moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christian Chace can be reached on (571) 272-4190. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CPC/mb
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Supervisory Patent Examiner, Art Unit 2187